

REMARKS

Examiner Webman granted applicant the courtesy of a personal interview on December 5, 2003. In the course of the interview, the following issues and arguments were discussed in general and it was agreed that the discussion would be memorialized in an Amendment. Examiner Webman agreed to reconsider his rejection of the claims as amended in view of the discussion.

Claims 1-12, 15, and 18-22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Specifically, the recitation of specific plants other than rosemary is not disclosed in the specification, and a solvent "having a boiling point above 22 °C" is not disclosed in the specification.

Claims 1, 20, and 22 have been amended to remove the "having a boiling point above 22 °C" language and so are believed to overcome the 112 rejection on this point. Claim 2 has been cancelled as redundant in view of the amendment to claim 1.

The 112 rejection with respect to the listing of specific plants other than rosemary is respectfully traversed. The specification as originally filed recites in numerous places that it is directed to the extraction of antioxidant compounds from plants of the family Lamiaceae (sometimes variously referred to as the family Labiatae). All of the specific plants listed in the claims are members of Lamiaceae/Labiatae. In addition, there are two specific references in the specification as filed to the antioxidant activity of compounds extracted from sage, one at page 1, line 23, and another at page 2, lines 7 and 8, and there is also a reference to antioxidant compounds found in the family Lamiaceae at page 2, lines 17 and 18. There is clear support in the specification as filed for the specific plants listed in the claims.

Accompanying this Amendment is a copy of Cuppett, S. L. and C. A. Hall III. 1998. Antioxidant Activity of the Labiatae. Adv. Food Nutrition Res. 42: 245-271. This article describes the well-known use of members of the Lamiaceae/Labiatae family as a source of antioxidant compounds. Table 1 (page 246) lists "Labiatae Species used for the Active Compounds" and includes basil, hyssop, marjoram, spearmint, oregano, rosemary, sage, and thyme. Moreover, at the bottom of page 249 and continuing on pages 250 and 251, Cuppett et al. states: "Many spices and herbs that display antioxidant activity also display antimicrobial

activity, both activities have been shown to be related to their phenolic structure (Tsimidou and Boskou, 1994). A relationship between the antioxidant activity and chemical composition was proposed by Farag et al. (1989).” Figure 1 (page 250) displays the structure of phenolic compounds, specifically monoterpenes, of the Labiatae plants caraway, clove, cumin, rosemary, sage, and thyme. At page 253, first paragraph, it is reported that supercritical carbon dioxide extraction had been used to produce extracts of rosemary and sage and that the process was reported to extract more than 60% of the phenolic diterpenes from rosemary and sage. Carnosic acid was identified as the major (75%) constituent of the extract.

Also accompanying this Amendment are copies of Wagstaff, S. J. and R. G. Olmstead. 1992. Phylogeny of *Labiatae* and *Verbenaceae* Inferred from *rbcL* Sequences. Syst. Botany. 22(1): 168-179 and Wagstaff, S. J., Hickerson, L., Spangler, R., Reeves, P. A., and Olmstead, R. G. 1998. Phylogeny in *Labiatae* s.l., inferred from cpDNA sequences. Pl. Syst. Evol. 209: 265-274. Both of these articles describe the use of genetic markers to resolve phylogenetic relationships in Labiatae species and present relatedness trees that closely follow relatedness trees that were based on taxonomic classifications. These articles provide evidence of the genetic relatedness of the members of the Lamiaceae/Labiatae family.

These article show that persons skilled in the relevant art know that members of the family Lamiaceae/Labiatae share a genetic background and the production of similar and sometimes identical phenolic compounds, including mono and diterpenes. They also know that these compounds are the result of chemical pathways of the related plants that are identical or similar. Anyone who cooks knows the fragrance and taste importance and similarities of the specific plants recited in the claims. These fragrances and tastes are due to compounds that are formed by the plants using closely related chemical pathways. The same is true with respect to the antioxidant compounds carnosic acid and carnosol. Those skilled in the art recognize that the teaching of a method of extraction of carnosic acid and carnosol from one specific plant of a genetically related family of plants will also function to extract such compounds from closely related plants that also produce such compounds as a result of their genetic relatedness and sharing of identical or similar chemical pathways. In that the specification as originally filed contains references to the presence of carnosic acid in the family Lamiaceae/Labiatae and also to the presence of antioxidant compounds extracted from sage, the specific plants listed in the claims were described in such a way as to reasonably convey to one skilled in the relevant art

that the inventors had possession of the claimed invention at the time the application was filed. The 112 rejection should be reconsidered and withdrawn.

The Examiner objected to the inclusion of rosmanol and rosmarinic acid in claim 22. Although the inventors maintain that the recitation of rosmanol and rosmarinic acid were contemplated within the scope of the invention at the time of filing, they have been removed from claim 22.

Claims 1-5, 9-12, 15, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budvari et al. (the Merck Index) in view of WO 95/26794. Budvari et al. is used for its teaching that rosemary is used in perfumery and contains oil of rosemary. Applicant agrees fully with this teaching of Budvari et al. but asserts that such teaching does not in any way adversely affect the patentability of the claims of the invention. The basis for this goes to the very heart of the present invention and how completely distinct it is from the cited prior art. The antioxidant compounds extracted by the process of the present invention have no noticeable fragrance. They are utterly useless in perfumery. Indeed, it is the fragrance and taste of prior art extracts of Lamiaceae species that have presented difficulties in their use as antioxidant compounds in the past, particularly for protecting foods against oxidation, because such prior art extracts usually included some of the volatile aromatic compounds for which these plants are well known and these compounds would impart a fragrance and flavor that would be unacceptable in most food applications. It is precisely these aromatic compounds that are extracted by the method taught in the WO '794 reference. Using tetrafluorethane and a cosolvent which boiled off with the TFE at room temperature and pressure, the WO '794 reference extracted particularly pure and clean aromatic compounds from plant material.

In the paragraph that bridges pages 3 and 4 of the Office Action, the statement is made that "[a]s to the claimed extract in edible oil, such is well known, even to the layman, in salad oils. For imparting flavor and aroma. As to the claimed antioxidants, they must be extracted as well, because the process of WO '260 [sic – WO '794] is the same as that claimed." This is not a correct statement. The WO '794 process is not the same as the claimed process. WO '794 teaches only the use of cosolvents having a boiling point below 20°C. It teaches nothing whatsoever about the use of cosolvents with higher boiling points. While the specification does say that it is preferred to use solvents having a boiling point below 20°C, none of the solvents recited in the specification have a boiling point higher than 20°C. Moreover, as is taught in the

present specification, the use of cosolvents having a boiling point above 22°C extracts the desired antioxidant compounds of the present invention and does not extract the aromatic compounds desired in the WO '794 reference as evidenced by the teaching in the specification of the low level of fragrance and taste in the extracts of the present invention. This difference in the compounds extracted by the two methods may be explained by the difference in the volatility of the extracted compounds. The fragrances or aromatic compounds extracted by the WO '794 method are relatively volatile compounds; a fragrance must be volatile for it to be smelled. The carnosic acid extracted by the present method, on the other hand, is a powder at room temperature. Since there is a direct relationship between volatility or boiling point and polarity, that is, compounds with lower polarity have, in general, a lower boiling point, the aromatic compounds extracted by the WO '794 method are less polar than the antioxidant compounds extracted by the method of the present invention. It is also well known that compounds of low polarity are not generally soluble in compounds of high polarity, and vice versa. The WO '794 method uses cosolvents of low polarity and low boiling point to extract compounds of low polarity and low boiling point; the method of the present invention uses cosolvents of higher polarity and higher boiling point to extract compounds of higher polarity and higher boiling point.

A transposition error was made in providing the Great Britain reference. The actual number is GB 2324050. Applicant apologizes for the error. A copy of this reference is of record, having been submitted in the original Information Disclosure Statement filed with the Patent Office.

Applicant is resubmitting the Declaration filed April 29, 2003, now supported by lab notebook pages which record the recited experiments.

A copy of the Aruoma et al. reference is also attached to this Amendment.

The application has been amended to correct minor informalities, to further distinguish the application over the prior art, and to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention so as to place the application, as a whole, into a prima facie condition for allowance. Great care has been taken to avoid the introduction of new subject matter into the application as a result of the foregoing modifications.

Accordingly, the purpose of the claimed invention is not taught nor suggested by the cited references, nor is there any suggestion or teaching which would lead one skilled in the

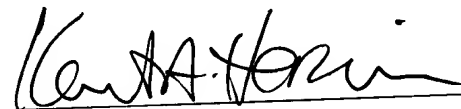
relevant art to combine the references in a manner which would meet the purpose of the claimed invention. Because the cited references, whether considered alone, or in combination with one another, do not teach nor suggest the purpose of the claimed invention, Applicant respectfully submits that the claimed invention, as amended, patentably distinguishes over the prior art, including the art cited merely of record.

Based on the foregoing, Applicant respectfully submits that its claims 1, 3-8, 10-12, 15 and 18-21, as amended, are in condition for allowance at this time, patentably distinguishing over the cited prior art. Accordingly, reconsideration of the application and passage to allowance are respectfully solicited.

The Examiner is respectfully urged to call the undersigned attorney at (515) 288-2500 to discuss the claims in an effort to reach a mutual agreement with respect to claim limitations in the present application which will be effective to define the patentable subject matter if the present claims are not deemed to be adequate for this purpose.

Respectfully submitted,

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